ATTORNEY DOCKET NO.: N1085-00188 [TSMC2003-0327]

What is claimed is:

1. A method of etching a nitride-based bottom etch stop layer in a copper damascene structure comprising:

etching the bottom etch stop layer using a high density, high radical concentration plasma containing fluorine and oxygen.

- 2. A method according to claim 1, wherein radical-to-ion ratio in the high density, high radical concentration plasma is greater than about 10:1.
- 3. A method according to claim 1, wherein the nitride-based bottom etch stop layer is silicon nitride.
- 4 A method according to claim 1, wherein the nitride-based bottom etch stop layer is oxynitride.
- 5. A method according to claim 1, wherein the fluorine is provided by at least one of CF₄, CHF₃, SF₆, NF₃, C₂F₆, C₄F₈, CH₂F₂, CH₃F, and C₄F₆.
- 6. A method according to claim 1, wherein the high density plasma further comprises N₂ and any one of inert gases.
- 7. A method according to claim 1, wherein the copper damascene structure is a via step.
- 8. A method according to claim 1, wherein the copper damascene structure is a single damascene structure.
- 9. A method according to claim 1, wherein the copper damascene structure is a non-intermediate etch stop layer dual damascene.